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9/12/84

PRELIMINARY
SITE INSPECTION REPORT

OK

Resource Recovery Corporation
TDD R10-8408-22

Site Name/Address

Resource Recovery Corporation
Pasco Sanitary Landfill
Kahlotus Road and Highway 12
Pasco, WA 99301

Investigation Participants

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Principal Site Contacts

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Pasco Sanitary Landfill, (509) 547-4802
John Zillich, Project Manager, J-U-B Engineers (JUB),
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Date of Inspection

9/12/84 0800 hrs.

1.0 Introduction

Resource Recovery Corporation (RRC)/Pasco Sanitary Landfill (PSL) has been identified by the U.S. Environmental Protection Agency (EPA) Region X and WDOE from preliminary assessment screening as requiring additional information to accurately profile the nature and extent of past waste disposal activity at the site. E&E has been requested by EPA under Technical Directive Document No. R10-8408-22 to conduct a site inspection and evaluate the facility's status within the Agency's Uncontrolled Hazardous Waste Site Program. This report summarizes the results of E&E's preliminary site inspection and is divided into the following sections:

- o Site Location
- o Hydrogeology
- o Disposal Practices
- o Past Investigations
- o Observations

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2.0 Site Location

The PSL is located 1.5 miles northeast of Pasco, Washington in the SW 1/4 of Section 5 and the NW 1/4 of Section 22, Township 09 north, Range 30 east, Willamette Meridian, Franklin County (Figure 2.1). The PSL has been operated as a landfill since 1956 (1). The facility has received primarily municipal wastes with the exception of a period from 1972 to 1980 when it was also operated as a regional hazardous waste site.

The site has been owned and operated by Larry Dietrich since January 1981. Records indicate that John Dietrich owned the site from 1956 to 1981. The site was leased to the Resource Recovery Corporation during the time period when it was operated as a regional hazardous waste site (1).

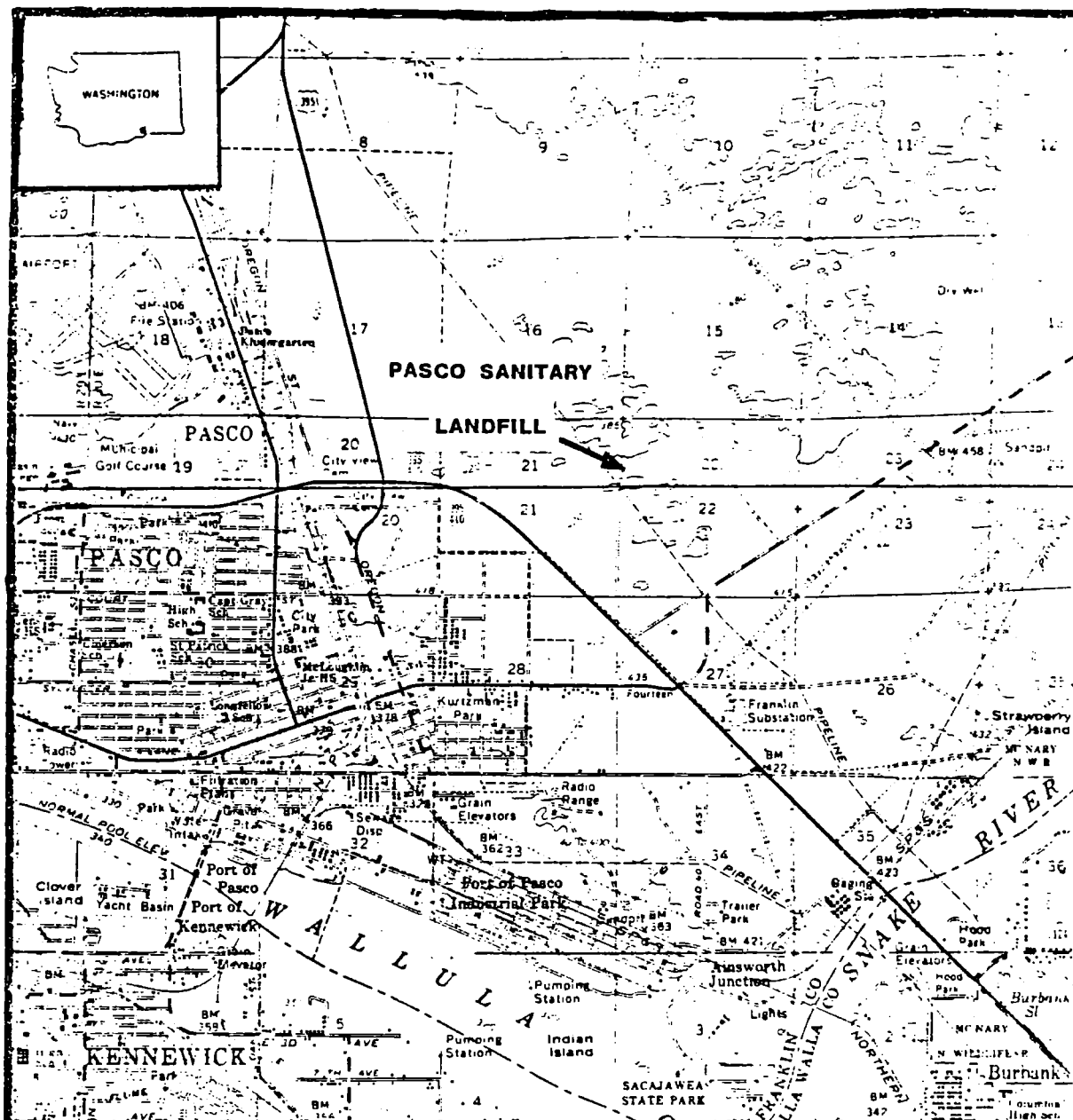
The average elevation of the site is 410 feet above mean sea level (MSL) with the land sloping approximately 1 to 3 percent to the west-southwest. The land in the general vicinity of the site is rural (population approximately 35 people within a 1 mile radius) intermixed with irrigated agricultural fields and range land.

3.0 Hydrogeology

The generalized description of the geologic units underlying PSL is presented in Table 3.1.

TABLE 3.1
DESCRIPTION OF GEOLOGIC UNITS (2,3,4)

Geologic Unit Sub-Unit	Depth (feet)	Description	Permeability (cm/sec)
Eolian Sand and Silt	surface	Light brown. Very fine sands and silts.	10^{-3} - 10^{-5}
Touchet Formation	0-40	Light to medium brown. Very fine to medium grained sands. Occasionally slight to very silty.	10^{-3} - 10^{-5}
Pasco Gravels	40-60	Dark grey. Locally fine to coarse grained sands with occasional gravel.	$>10^{-3}$
Ringhold Formation Ringhold Sands	60-100	Dark grey. Medium to coarse grain with gravel. Gravel increasing and getting coarser with depth.	$>10^{-3}$
Ringhold Gravels	100-110	Tan gravel with sand.	$>10^{-3}$
Ringhold Clays	>110 -140	Blue clay.	
Yakima Basalt	>140	Basalt	10^{-2} - 10^{-5}



LEGEND

CONTOUR INTERVAL: 20 FEET

SCALE: 1 INCH = 1 MILE



FIGURE 2.1

TITLE: VICINITY MAP
PASCO SANITARY LANDFILL

CLIENT: EPA REGION X

I.D.D R10-8408-22

ecology and environment, inc.
SEATTLE, WASHINGTON

Groundwater beneath the site occurs in the Yakima Basalt sequence and the overlying sedimentary materials. The disposal site will have a potential impact only on the groundwater in the sedimentary materials (2). The depth to the water table aquifer is approximately 55 feet below the average land surface (approximately 355 feet MSL), thus the surface of the groundwater tops the Ringhold Sands and is in the Pasco Gravels (2). Groundwater movement is in a general southwesterly direction toward the Columbia River (Figure 3.1). The major use of groundwater in the area is crop irrigation. The site has a semi-arid climate with an overall negative water budget of approximately 32-inches per year (3). The two year 24-hour rainfall is 0.8-inches, with July being the driest month having less than 0.2-inches of rainfall (6).

4.0 Disposal Practices

The PSL site was operated as an open burning dump from 1956 to 1971 (1). The primary wastes accepted were municipal wastes which were dumped on the ground surface and periodically burned. In 1971 the operation was changed from an open burning dump to a sanitary landfill; the burning activity stopped and the refuse was periodically covered with soil (1).

Resource Recovery Corporation leased a portion of the landfill in 1972 from the landowner John Dietrich and began operating a regional hazardous waste site. The site was managed by Larry Dietrich (John's son) as an employee of the corporation. The operator accepted and disposed of hazardous wastes in sub-sites from 1973 through 1981 under WDOE Permit #5301 issued March 21, 1973. The majority of hazardous wastes were accepted from 1972 to 1974; Table 4.1 summarizes the types, quantities and disposal locations (if known) for this period. The sanitary landfill operation also continued during the period of time Resource Recovery leased the site. In addition, in 1974 a sewage evaporation lagoon was constructed for the disposal of septic tank wastes (Figure 3.1).

Resource Recovery Corporation operated the site until January 1981, at which time the operation lease terminated and all interests RRC had in the operation reverted to the Dietrichs. Larry Dietrich has operated the site as a sanitary landfill since 1981.

5.0 Past Investigations

5.1 WDOE Investigation

In September 1973, the WDOE ordered an investigation of RRC operation at PSL. This was initiated because of the concerns of local farmers and the WDOE relating to the potential effects of the materials buried at the site on the local agricultural crops. The investigation included a site visit to ascertain current site conditions, waste types disposed of at the site and their potential impact on groundwater, as well as possible air contamination. No samples of the wastes or groundwater were collected or analyzed by the WDOE.

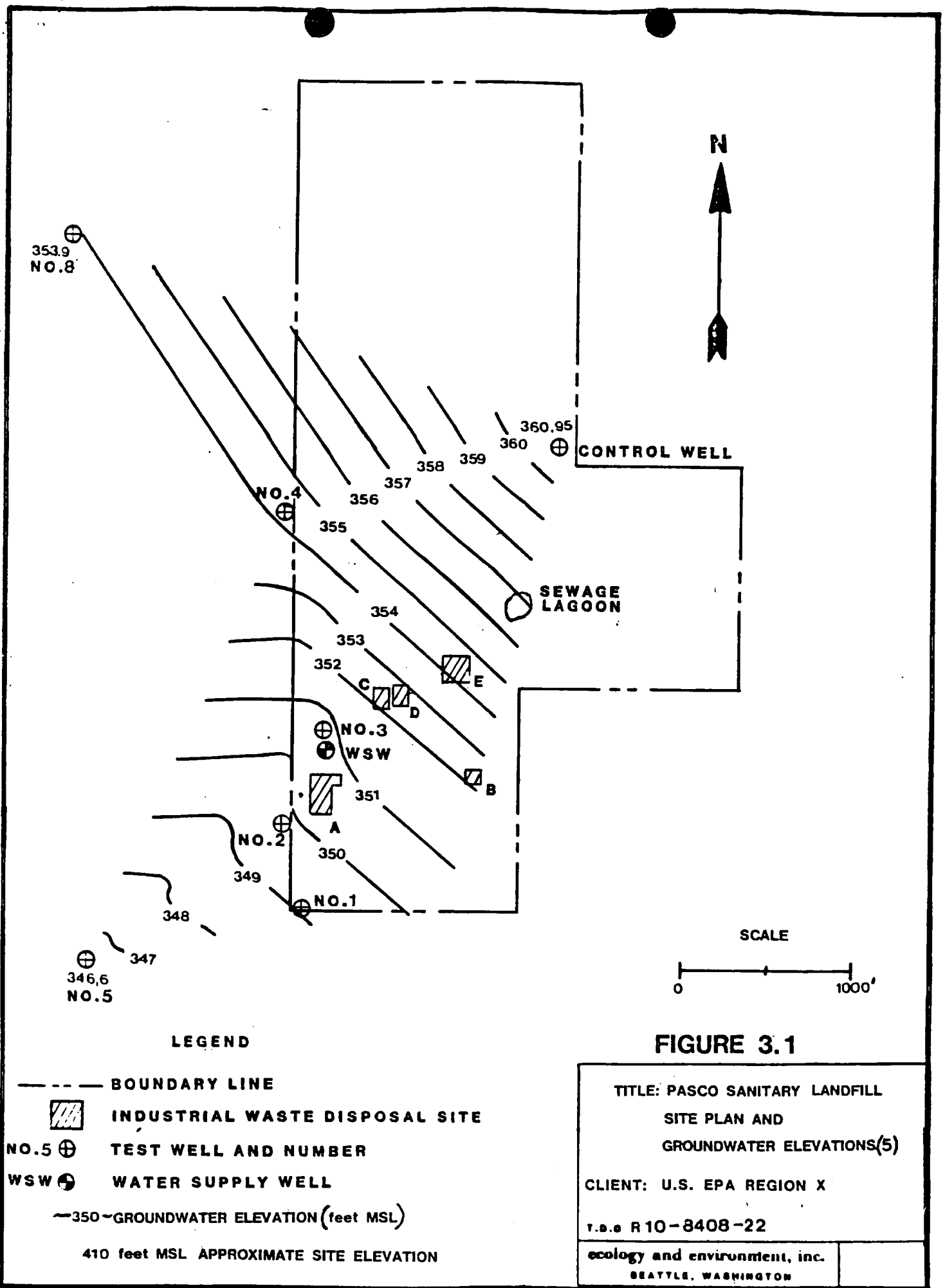


TABLE 4.1
WASTE QUANTITIES DISPOSED OF
AT PSL BY RRC

Location(5)	Description(7) (Size*/Lining)	Waste Type(2,8)	Estimated Quantity (2,5,8)	Units
Site A	100'x100' bottom unlined top lined	acids	544	drums
		aromatic tars	160-248	drums
		carcinogenics (unspecified)	9	drums
		caustics	8,774	drums
		cedimum	11	drums
		metal finishing	244-304	drums
		oil sludge	433	drums
		paint	10,258-24,200	drums
		pesticides	425	drums
		pesticide containers (empty)	791-863	drums
Site B	50'x50' bottom unlined top lined	2,4-D manufacturing	2,011-5,080	drums
Site C	75'x75' bottom unlined top lined	acids	7,000	gallons
		acid metal cleaning	2,301,560	pounds
		lime phenol	684,967	gallons
		metal cleaning	185,162	gallons
		metal finishing	17,000-35,724	gallons
		metal finishing	1,460,602-1,949,652	pounds
Site D	75'x75' bottom unlined top lined	aromatic tar	499,270	pounds
		cutting oil	76,350-84,300	gallons
		fertilizer manufacturing	228,288	pounds
		oily sludge	6,000-66,340	gallons
		paint	72,475-497,418	pounds
		paint	66,516-95,711	gallons
		plywood resin	1,393,380-2,215,440	pounds
		solvents	12,648	gallons
Site E	unknown bottom and top lined	barium with mercury	10,500-11,582	tons
Unknown	unknown	acid sludges	1,000	gallons
		acid wash solution	312,350	pounds
		benzoic acid and tar	176,000	pounds
		chemistry lab reagents	1	drum
		chrome rinse water	700,901	pounds
		DCP tar	8,790	gallons
		etching solution	1,914	barrels
		lime sludge	80-160	drums
		MCPA bleed	104,318-327,000	gallons
		MCPA tar	2,965-3,037	drums
			939	drums
			2,813	barrels
			680	pails
		metal casing wastes	3,300-5,760	drums
		misc. lab chemicals	29	sm. containers
		NH ₄ ⁺ and NaOH		
		chemical solutions	17,238	gallons
		oily sludge	166,680	pounds
		other miscellaneous	435	drums
		pesticide containers	1,045	each
		resin manufacturing	392,553	gallons
		solid caustic soda	44,550	pounds
		wood treatment/preservative	294,662	gallons
			238	drums

*The depths of the burial sites are unknown. All linings are 4 mil polyethylene and all sites are covered with soil.

The WDOE prepared a report which was published in December 1973. In their report, WDOE stated that the site was in an excellent location for ground disposal of industrial solid wastes, if the proper safeguards are observed. Further, that the arid climate prevents the leaching of solid wastes disposed into the ground and is conducive to on-site concentration and desiccation of liquid wastes. They also concluded that since the water table is relatively shallow, it is not acceptable to dispose of liquid wastes directly to the ground in unlined pits or trenches. The state decided that the probability of air pollution at the site was considered to be low. Figure 5.1 explains the site structure during this WDOE investigation. The report concluded the following recommendations:

- o all materials received for disposal at the site shall be recorded as to the type, chemical composition and quantity;
- o abandoned disposal sites must be permanently monumented;
- o all trenches intended for the disposal of hazardous wastes should be lined.

5.2 J-U-B Engineers Reports

J-U-B Engineers have been contracted by the operator of the PSL as consultants to plan and implement the groundwater quality program at the PSL site. The engineering firm has completed 2 major reports on the PSL.

J-U-B Engineers first report (June 1981) responded to several issues which the WDOE raised in a letter to the PSL on 18 February 1981. The report included the following (9):

- o a discussion of the percolation of septic wastes and their impact on hazardous wastes which were disposed of on-site;
- o documentation procedures of septic wastes received at PSL;
- o direction and velocity of groundwater flow;
- o current groundwater monitoring program;
- o estimated the transmissivity and permeability of the water table aquifer at the site.

The authors concluded that:

- o the industrial waste disposal sites are not being saturated by lateral movement of waste waters from the sewage lagoons;
- o the groundwater flow direction and quality have been determined near the landfill site but an additional well is needed at the southern boundary to verify flow;
- o a groundwater monitoring program has been established to determine current and future impacts of site operations.

In July 1983, J-U-B Engineers published a second report on the PSL which was a summary of past quarterly groundwater sampling. This report included:

- o a summary of the construction of six groundwater monitoring wells completed in January 1982 (Figure 5.2);
- o tentatively identified the direction of groundwater flow;
- o summarized the analytical results of quarterly groundwater samples collected by J-U-B Engineers from January 1982 to March 1983;
- o compared the groundwater quality to health effect limits.

J-U-B Engineering concluded the following:

- o existing monitoring wells are located in such a manner that they will detect any leachate migration from the industrial and solid waste areas and the sewage evaporation lagoon;
- o the wells are constructed to obtain water from the upper 20 feet of the water table aquifer where contaminants from the landfill would be most readily observed;
- o sampling results for health-effect related parameters show concentration to be largely below detection limits and in all cases below the EPA allowable contaminant levels.

There are a number of discrepancies between the disposal sub-site descriptions in Figure 5.1 and 5.2. The exact size and location of each disposal sub-site is in question as is the identification numbering system. Table 5.1 is a cross reference of both parties numbering systems.

TABLE 5.1
CROSS REFERENCE OF J-U-B AND WDOE
DISPOSAL SUB-SITE NUMBERING SYSTEM (10)

J-U-B	WDOE	Description
A	1	Disposal of containerized wastes
B	6	Disposal of containerized herbicide wastes
C and D	2 to 5	Evaporation ponds
E	8 and 9	Unlined trenches for disposal of chloralkali sludges
F ₁	NI	Solid Waste fill area
F ₂	7	Solid Waste fill area
NI	10 to 14	Never used

NI - Not Identified

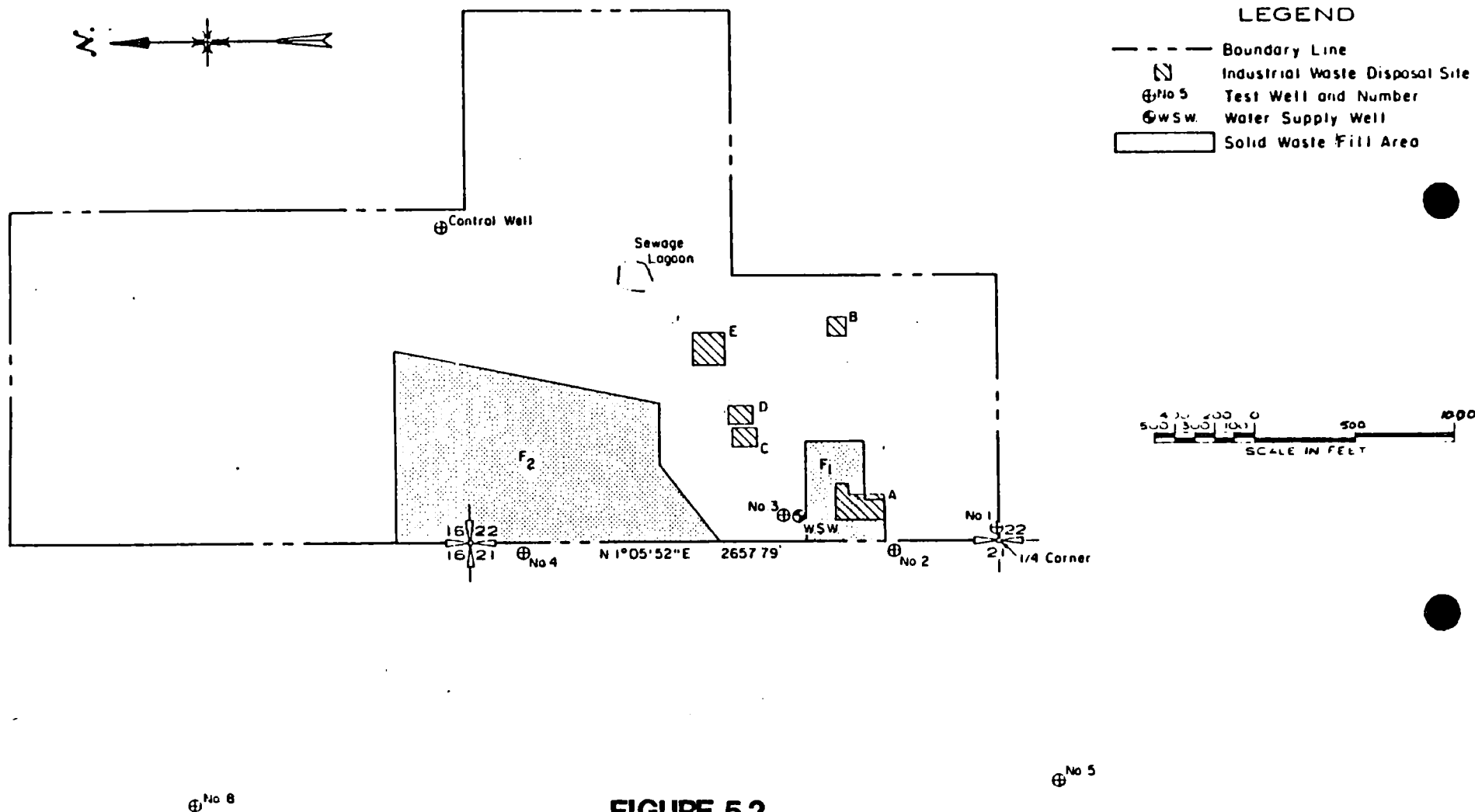


FIGURE 5.2
PASCO SANITARY LANDFILL
WASTE DISPOSAL AND WELL LOCATIONS(5)

5.3 Preliminary Assessments (PA) and Site Inspections (SI)

Table 5.2 summarizes the PA's and SI's which have been conducted to date.

TABLE 5.2
SUMMARY OF PA AND SI ACTIVITIES (11)

Activity	Date	Responsible Agency
Identification of Potential Problem	07-79	EPA
SI	07-79	EPA
PA	08-79	EPA
SI	04-80	WDOE
PA	04-84	JRB Associates
Hazard Ranking		
System Score	04-84	Unknown
SI	09-84	E&E

6.0 Observations

On September 12, 1984, a site inspection was conducted at PSL. The site inspection began at 0800. Mike Gallagher (WDOE), Larry Deitrich (PSL), John Zillich (J-U-B Engineering), Peter Evers (E&E), and Richard Brooks (E&E), were present. The inspection included a discussion about background information, a site tour, and sample collection. It was noted during the site tour that no drums or hazardous wastes were visible at the surface and no color stains or leachate seeps were observed.

Three groundwater samples were collected during the inspection. The results of the analysis of these samples are contained in Appendix A. This data indicates that there is no organic contamination from the site reaching the groundwater which was sampled. The inorganic analysis revealed higher levels of heavy metals in the well which has been identified as the control well (Table 6.1).

TABLE 6.1
COMPARISON OF SELECTED HEAVY METALS (ug/l)

Metal	Upgradient Well	Well No. 3	EPA Recommended Level*
Aluminum	102,000	41,500	---
Arsenic**	39	28	50
Barium	1,631	785	1,000
Beryllium	7	5 U	1.17
Cadmium	1.9	1 U	10
Chromium	106	46	50
Cobalt	170	5 U	---
Copper**	280	120	1,000
Iron	199,900	97,450	---
Lead	160	70	50
Manganese	4,380	1,694	---
Nickel**	162	63	13.4
Vanadium	302	200 U	---
Zinc	514	207	5,000

*Compiled from a) National Interim Primary Drinking Water Regulations, EPA Office of Water Supply, 1979.

b) Water Quality Criteria Documents, Federal Register, Vol. 45, No. 231, November 1980.

U - Under detection limit (listed next to value).

** - Refer to cover memorandum to the inorganic data for discussion of these values.

This data suggests that:

- o the actual direction of groundwater flow is possibly not in the direction which has been tentatively identified;
- o hazardous wastes may have been disposed of upgradient of the control well which have not been identified in past reports and may have migrated to this well.

Because of this uncertainty, it can not be determined if the inorganic contamination is originating on or off-site.

7.0 Discussion

One factor that may effect the quality of analytical data of the groundwater samples collected from the PSL is the monitoring well design (Figure 7.1). The wells are screened at 2 intervals separated by approximately 15 feet. The water samples are obtained by placing a

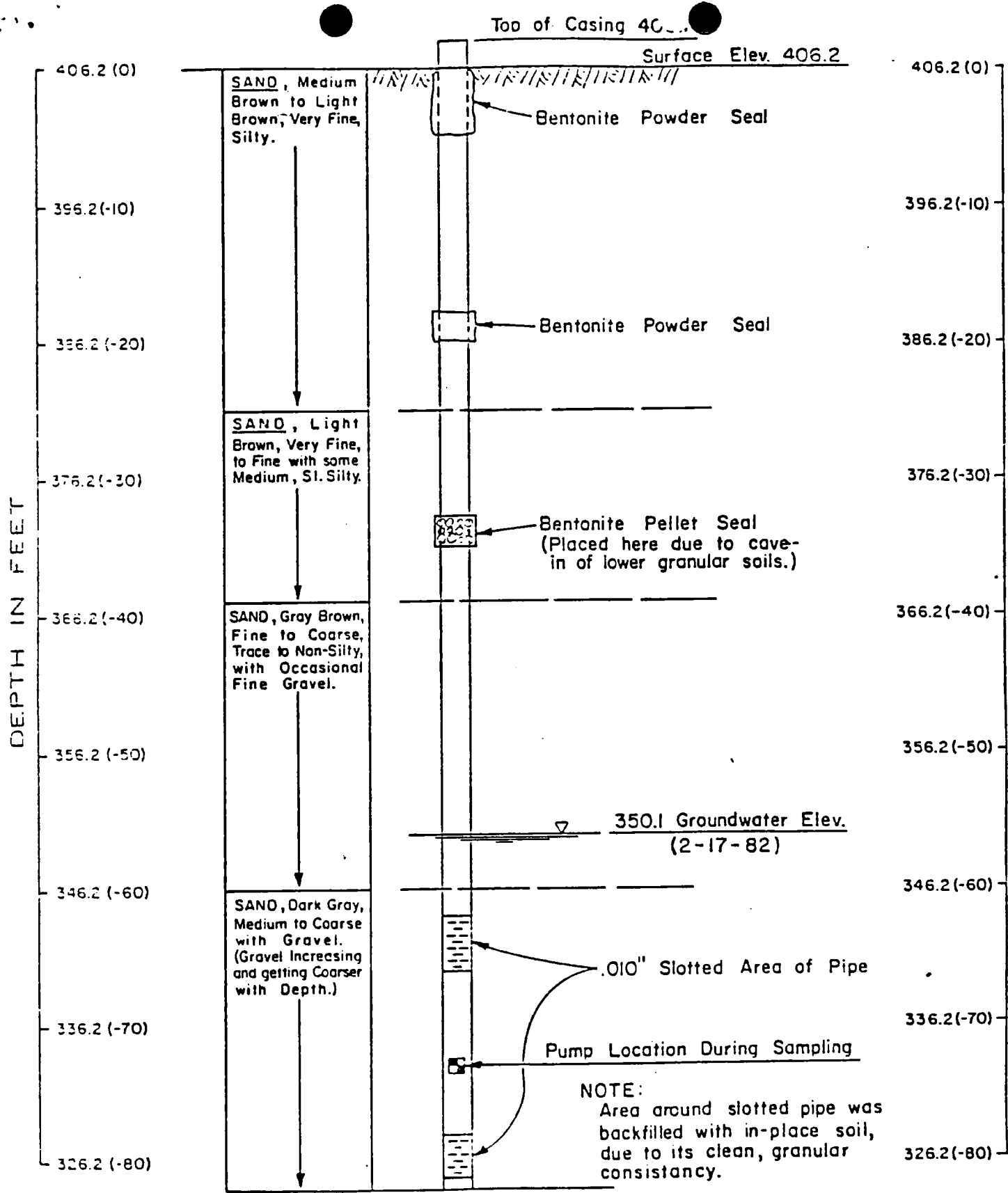


FIGURE 7.1
WELL NO. 2 (5)
INSTALLED 1-14-82

pump halfway between these screens. Utilizing this design there is no assurance that:

- o equal amounts of water are extracted from each screened interval;
- o the depth from which the sample is being collected is accurately known;
- o the concentrations of contaminants are representative of the actual groundwater conditions due to the potential unequal volumes of water are extracted from each screened interval.

It is difficult to compare previous groundwater analytical data available and establish possible trends of contamination at the PSL. The samples collected by J-U-B Engineers were analyzed for different parameters than those collected by E&E. The analytical data which is contained in the J-U-B report is incomplete in that the units of measurement are not given. The exception to this are the metals data which are contained in Table 7.1, these metals were analyzed for by both firms.

TABLE 7.1
COMPARISON OF PREVIOUS ANALYTICAL DATA METAL (ug/l)

Well Number	Date Sampled	Arsenic	Barium	Cadmium	Chromium	Lead
Upgradient	17-18/02/84	10 U	100 U	1 U	5 U	5 U
	12/09/84	39**	1,631	1.9	106	160
3	17-18/02/84	10 U	100 U	1 U	5 U	5 U
	12/09/84	28**	785	1 U	46	70

U - Under detection limit (listed next to value)

** - To cover memorandum to the inorganic data for discussion of these values

It can be interpreted from the data contained in Table 7.1 that the levels of metal contamination have increased between samplings. Records of materials disposal of on-site indicate that at least 3 of the 5 metals described in Table 7.1 were disposed at the PSL. These include: Barium, Chromium, and Lead.

Evaluation and Recommendation - Resource
Recovery Corporation

Based on existing data and documentation, further investigation is needed to assess the potential hazard associated with this site. Because of the toxic nature of many of the compounds (e.g. 2,4-D, MCPA) which have been disposed of at PSL and the observed increase of contaminants in the on-site and control wells, the following recommendations should be considered:

- 1) Further investigation should be carried out to determine the validity of the site's disposal records. There are a number of variations relating to the quantities and types of wastes which have been disposed of at the PSL.
- 2) Resample all of the wells on-site and analyze for the compounds identified on the EPA Priority Pollutant List including dioxins.
- 3) Monitor the wells and determine whether or not seasonal fluctuations (due to local irrigation demands) of groundwater flow exist which could transport contaminants toward the on-site control well.
- 4) Collect subsurface soils samples adjacent to all waste disposal areas to determine whether or not wastes are leaching from these areas.
- 5) Contact the chemical toilet firm which is disposing waste water in the sewage lagoon and determine if any chemicals which they are using are hazardous.

These recommendations should be pursued on a medium priority basis.